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R E M A R K S

Claims 1 – 15 are pending in the application.

In the present amendment, claims 1, 14 and 15 are amended. No new matter is added.

35 U.S.C. §112

The Office Action rejects claim 14 under 35 U.S.C. §112. Claim 14 is amended to obviate this rejection. Withdrawal of the rejection of claim 14 under 35 U.S.C. §112 is respectfully requested.

35 U.S.C. §101

The Office Action rejects claim 14 under 35 U.S.C. §101. Claim 14 is amended to obviate this rejection. Withdrawal of the rejection of claim 14 under 35 U.S.C. §101 is respectfully requested.

35 U.S.C. §102(e)

The Office Action rejects claims 1, 2 and 15 under 35 U.S.C. §102(e) over Huang et al. (US 2002/0133070 A1, hereinafter Huang).

Applicants submit that for at least the following reasons, claims 1, 2 and 15 are patentable over Huang.

For example, claim 1, in part, requires:

> "*An image processing system having image data processing means of automatic adaptation of 3-D Mesh Model to image features.*" (Emphasis added)

Applicant submits that Huang does not disclose or otherwise suggest Applicants' image processing system which is capable of automatic adaptation of a 3-D mesh model onto the surface of an object in a medical image. In the Office Action, page 3, it is suggested by the Office that if claims 1 and 15 were amended to actually include the limitation of a 3-D mesh model, it would overcome Huang. For at least

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the reason that amended claim 1 now contains the limitation of a 3-D mesh model, claim 1 is patentable over Huang.

Similarly, claim 15, in part, requires:

"automatically adapting 3-D Mesh Model to image features."

Applicant submits that claim 15 at least contains the limitation of a 3-D mesh model, therefore, claim 15 is patentable over Huang. Claim 2 is patentable over Huang because at least it depends from claim 1 with further distinguishing features. Withdrawal of the rejection of claims 1, 2 and 15 under 35 U.S.C. §102(e) is respectfully requested.

35 U.S.C. §103(a)

Under 35 U.S.C. § 103(a), the Office rejects claims 1, 2 and 15 over Delingette (General Object Reconstruction Based on Simplex Meshes, 1999); claims 3 – 7 over Delingette in view of Bernardini et al. (US 6,968,299 B1, hereinafter Bernardini); and claims 8 – 14 over Delingette and Bernardini and further in view of Vannah (US 6,201,889).

Applicant submits that for at least the following reasons, claims 1 – 15 are patentable over the references cited above, either singly or in combination.

For example, claim 1, in part, requires:

"means of locally setting higher resolution when <u>reliable image features</u> are found and means of setting lower resolution in the opposite case."
(Emphasis added)

In the Office Action, page 12 – 13, it is alleged by the Office that Delingette, page 118, column 2, paragraph 2 and table 5 discloses the above claimed feature. However, Applicants submit that the portion of Delingette cited by the Office concerns mesh transformation, noting that meshes can be locally refined or decimated. In the cited passage, there is no suggestion of setting higher resolution when reliable image features are found and setting lower resolution in the opposite case.

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In the Office Action, pages 4 – 5, it is noted by the Office that Delingette, page 127, describes refinement and adaptation adding vertices and moving them toward points of high curvature, and that Fig. 9(b) on page 121 shows increased resolution at areas of higher curvature. In the Office Action, page 5, it is further alleged by the Office that "Points of high curvature inherently have increased information content in the form of more high frequency content and are consequently more reliable indications of shape than points of low curvature." Applicants respectfully traverse such allegations.

Applicants submit that having points of high curvature does necessarily mean that there are more reliable image features. For example, a noisy image region, and hence being an unreliable image feature, may have many points of high curvature. This is because a determination of surface curvature involves taking partial second order derivatives of the surface, and the computation of the partial second order derivatives is very sensitive to noise. A high frequency noise in the image may result in a very high curvature value because the noise is found in the high frequency content. Since a noisy image having high curvature values is not a reliable image feature, therefore, an area having points of high curvature value does not necessarily imply that it is a reliable image feature. Thus, for the present example of an unreliable noisy image feature, the teaching of Delingette would require setting a higher resolution. In contrast, as recited in the claims, the present invention requires a lower resolution in the opposite case (i.e., when reliable image features are not found). Therefore, Delingette fails to disclose the claimed feature: means of locally setting higher resolution when reliable image features are found and means of setting lower resolution in the opposite case.

Applicants further submit that none of the secondary cited references does in any way cure the defects present in Delingette as discussed above. Therefore, claim 1 is patentable.

Similarly, independent claim 15, in part, requires:

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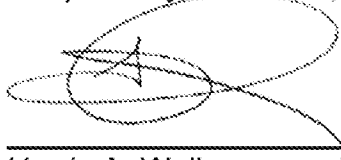Reply to Office action of 11 July 2008

"locally setting higher resolution when reliable image features are found and setting lower resolution in the opposite case."

Applicants essentially repeat the above arguments for claim 1 and apply them to claim 15 pointing out why claim 15 is patentable. Therefore, for at least the similar reasons as discussed for claim 1, claim 15 is patentable. Clams 2 – 14 are patentable because at least they depend from claim 1, with each claim containing further distinguishing features. Withdrawal of the rejection of claims 1 – 15 under 35 U.S.C. § 103(a) is respectfully requested.

In view of the foregoing, it is respectfully submitted that all the claims pending in this patent application are in condition for allowance. Reconsideration and allowance of all the claims are respectfully solicited.

In the event there are any errors with respect to the fees for this response or any other papers related to this response, the Director is hereby given permission to charge any shortages and credit any overcharges of any fees required for this submission to Deposit Account No. 14-1270.

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